University of Agronomic Sciences and Veterinary Medicine of Bucharest
Faculty of Horticulture

International Student Symposium *"Hortus Academicus"*
December 11, 2020, Bucharest, Romania

Reserch on the vegetative propagation of some species of *Begonia*

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Introduction

- **Kingdom**: Plantae
- **Subdivision**: Spermatophyta
- **Class**: Magnoliopsida
- **Order**: Violales
- **Family**: Begoniaceae
- **Genus**: Begonia L.
- **Origin**: Tropical and subtropical regions of the Americas, Asia and Africa
- **Etymology**: The name of the genus was given by the French botanist Charles Plumier, in honor of Michel Begon, governor of Santo Domingo.

The genus *Begonia* includes over 900 species of shrubs, bamboo, rhizomatous, tuberous or herbaceous, decorative with flowers or leaves. Among the decorative species through the leaves are very appreciated and spectacular species: ***Begonia christmas curl, Begonia confetti, Begonia midnight sky, Begonia silver dollar, Begonia cherry mint.***

Spectacular species

Begonia Smokey eyes

Begonia Cherry mint

Begonia Ferox

Begonia Escargot green

Begonia Christmas curl

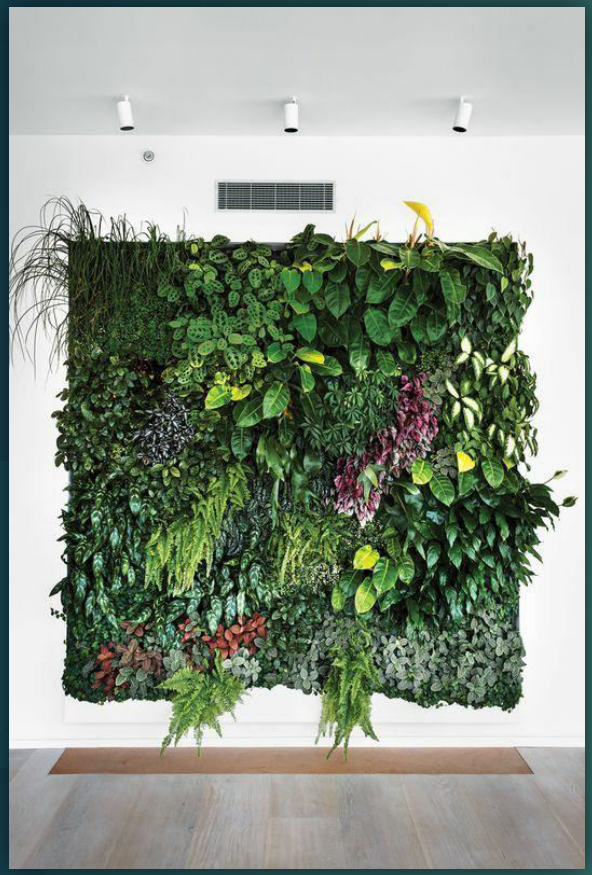
Begonia Midnight sky

Begonia confetti

Begonias require light, fertile humus rich substrates with a slightly acidic pH of 6-6.5.

The species of the genus Begonia are part of the category of decorative plants with leaves, and can be used both in interior decoration, plant walls, paintings, and in various floral designs.

Justification of the theme



I chose to study *Begonia* because I am passionate about decorative flowering plants through the chromatic and shape of the leaves.

The appearance in recent years of spectacular varieties from this point of view that can be successfully included in various designs and floral arrangements, vertical walls determined me to study the vegetative propagation of several species of *Begonia* and the subsequent classification of the plants obtained, in a floral picture and tracking their behavior from an evolutionary point of view.

Material and method

This experience was realized at the Hortinvest Greenhouses within the Faculty of Horticulture in Bucharest, starting in **10.07.2020.**

The biological material was represented by mother plants from **6 species** of *Begonia* from which shoots and leaves were harvested in order to make 2 types of cuttings, namely top sprouts and leaf cuttings, because the literature mentions the availability of some species and varieties of Begonia to propagate vegetatively and through whole-leaf cuttings.

Begonia imperialis

Begonia sp. 'Regal minuet'

Begonia Boweri 'Tiger'

Begonia sp.
'Merengue grande'

Begonia Boweri
'Tiger'

Begonia sp.
Silver

The made cuttings, coming from the 6 *Begonia* species, in order to take root, were divided into 2 culture substrates representing the 2 experimental variants, namely:

V1 represented by perlite

V2 represented by peat and perlite in a ratio of 1: 1

Also, the 2 types of cuttings made, represented the 2 experimental subvariants, namely:

a Sprout top cuttings

b Whole leaf cuttings

In the sight to root, plastic trays with dimensions 25x15x5 cm were used.

The top stems were shortened to about 2 cm, and the petiole of the whole leaf stems was shaped to 1 cm long

Each stems was passed through a coal dust before being planted in the rooting substrate.

Top stems *Begonia Imperialis*

Leaf stems *B. Sp. 'Regal minuet'*

Leaf cuttings *B. Boweri 'Eyelash'*

Top cuttings *B. Boweri 'Tiger'*

Top cuttings *B. Sp. 'Regal minuet'*

Top cuttings *B. Sp. 'Merengue grande'*

Leaf cuttings *Begonia merengue grande*

Distribution of cuttings by experimental variants, on 10.07.2020

Tabel 1

Nr crt	Variety name	Experimental variant	Experimental subvariant	Number of cuttings made
1.	*Begonia Imperialis*	V_1	a	10
			b	10
		V_2	a	10
			b	10
2.	*Begonia Boweri 'Tiger'*	V_1	a	5
			b	10
		V_2	a	5
			b	10
3.	*Begonia Boweri 'Eyelash'*	V_1	a	10
			b	10
		V_2	a	10
			b	10
4.	*Begonia sp. 'Silver'*	V_1	a	16
			b	14
		V_2	a	16
			b	12
5.	*Begonia sp. ,Merengue grande'*	V_1	a	5
			b	6
		V_2	a	5
			b	6
6.	*Begonia sp. 'Regal minuet'*	V_1	a	9
			b	6
		V_2	a	9
			b	6
Totally cuttings made				*220*

The legend:

V1 - Perlite
V2 - Peat and perlite

a - stems top shoots
b - whole leaf cuttings

Indicators followed

At the time of rooting the stems, a series of measurements and observations were performed as follows:

- ✓ height of cuttings (cm)
- ✓ the number of leaves
- ✓ leaf length and width (cm)
- ✓ petiole length (cm)
- ✓ total root length (cm)
- ✓ number of main roots and their length (cm)
- ✓ number of secondary roots and their length (cm)
- ✓ number of tertiary roots and their length (cm)

After rooting, the stems were planted in a mixture of leaf soil, peat and perlite (2: 2: 1/2) in pots with a diameter of 10 cm. After 2 weeks from planting, the viability percentage was established, depending on the variant and the experimental subvariant.

Results and discussions

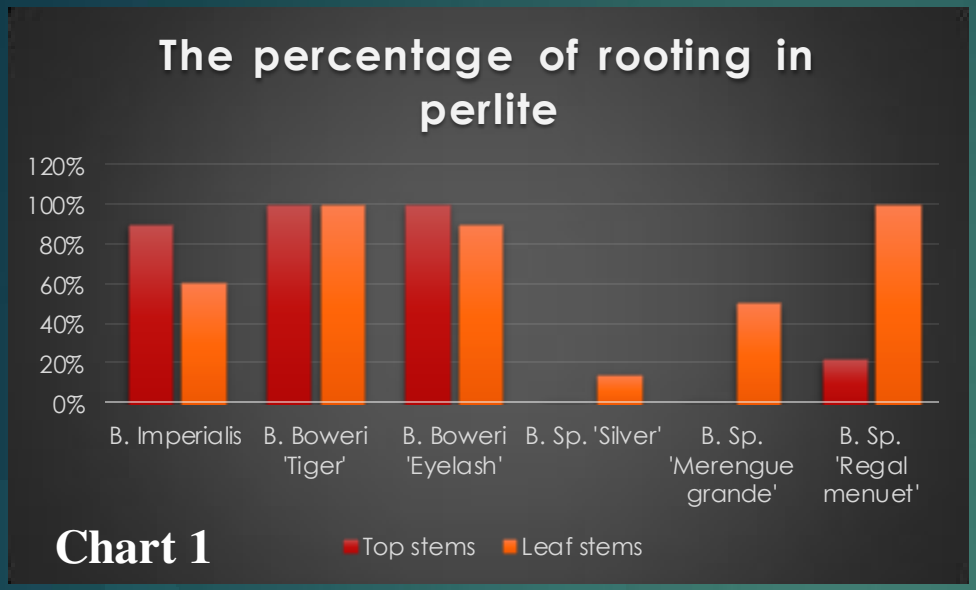


Chart 1

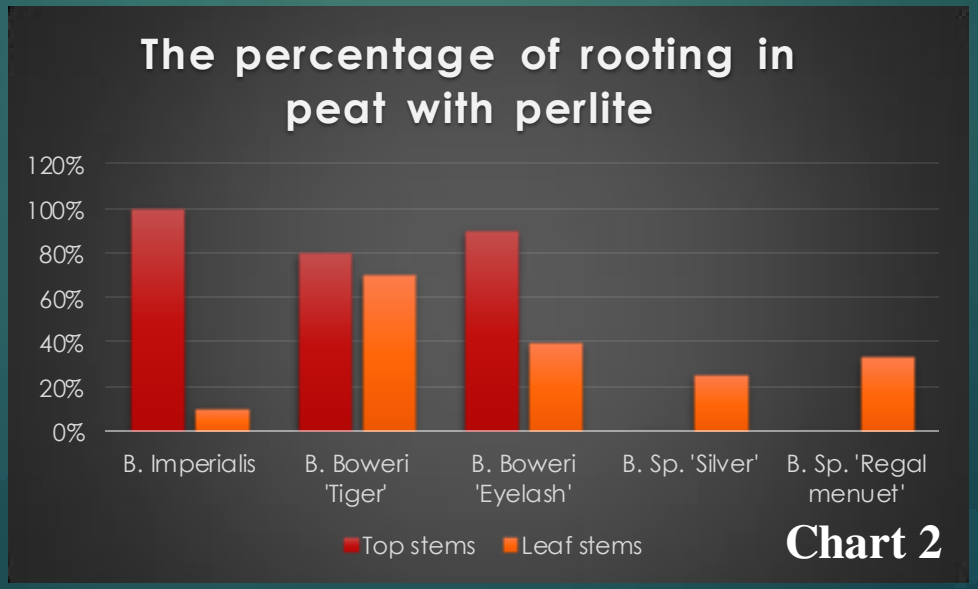


Chart 2

The growth and development stage of the rooted cuttings on 10.11.2020

Tabel 2

Nr crt	Variety name	Experimental variant	Experimental subvariant	Stems hight (cm)	Number of leaves	Length/ Width leaves (cm)	Petiole length (cm)	Total root length (cm)	Number of main roots	The length of the main root (cm)	The number of secundary roots	The length of the secondary roots (cm	The number of tertiary roots	The length of tertiary roots (cm)
1.	*Begonia Imperialis*	V_1	a	3,75	2,50	2,20/3,90	4,90	5,25	5,50	2,95	4,50	1,77	2,50	1,30
			b	4,75	2,00	2,12/3,00	2,37	5,00	3,00	3,08	1,50	1,66	3,00	0,50
		V_2	a	5,50	5,50	3,36/6,18	11,09	3,50	4,50	2,50	2,00	0,75	2,00	0,50
			b	4,00	6,00	1,66/2,25	2,58	4,00	4,00	2,62	2,00	0,75	-	-
2.	*Begonia Boweri 'Tiger'*	V_1	a	4,25	5,00	2,75/5,60	7,70	10,75	6,50	4,19	5,50	2,45	3,00	1,50
			b	5,50	2,50	1,80/3,30	3,50	9,25	3,50	4,64	2,50	2,00	4,00	0,62
		V_2	a	4,50	6,00	3,50/3,95	8,91	6,50	3,50	2,92	3,00	1,16	2,00	0,50
			b	4,66	2,50	1,54/1,86	2,68	4,33	3,33	2,70	2,66	0,75	2,00	0,50
3.	*Begonia Boweri 'Eyelash'*	V_1	a	6,25	4,50	2,05/4,38	1,94	6,75	4,00	4,37	4,00	1,50	3,00	0,83
			b	6,50	6,00	1,18/1,22	1,20	7,00	3,50	3,92	2,50	1,30	1,00	0,50
		V_2	a	5.50	3,50	2,85/5,28	3,28	6,00	3,50	3,00	2,00	1,00	3,00	0,50
			b	2,50	2,50	1,90/2,30	1,00	2,00	1,50	1,33	2,50	0,70	1,00	0,50
4.	*Begonia sp. 'Silver'*	V_1	a	-	-	-	-	-	-	-	-	-	-	-
			b	5,00	3,00	1,58/1,08	2,50	3,00	2,00	1,37	1,50	0,50	-	-
		V_2	a	2,00	7,00	1,70/1,70	2,96	3,50	3,00	1,75	2,00	0,62	1,00	0,50
			b	-	-	-	-	-	-	-	-	-	-	-
5.	*Begonia sp. 'Merengue grande'*	V_1	a	-	-	-	-	-	-	-	-	-	-	-
			b	3,25	3,00	2,41/1,83	1,58	5,00	3,50	2,00	2,00	1,25	2,50	0,70
		V_2	a	-	-	-	-	-	-	-	-	-	-	-
			b	-	-	-	-	-	-	-	-	-	-	-
6.	*Begonia sp. 'Regal minuet'*	V_1	a	4,50	2,50	1,90/1,90	1,60	1,52	5,50	0,75	2,00	0,75	-	-
			b	3,00	5,00	1,68/1,45	1,65	2,50	4,50	1,50	1,50	0,66	2,00	0,50
		V_2	a	-	-	-	-	-	-	-	-	-	-	-
			b	3,50	2,50	2,50/2,30	1,80	5,00	1,50	3,00	2,00	1,75	1,00	0,50

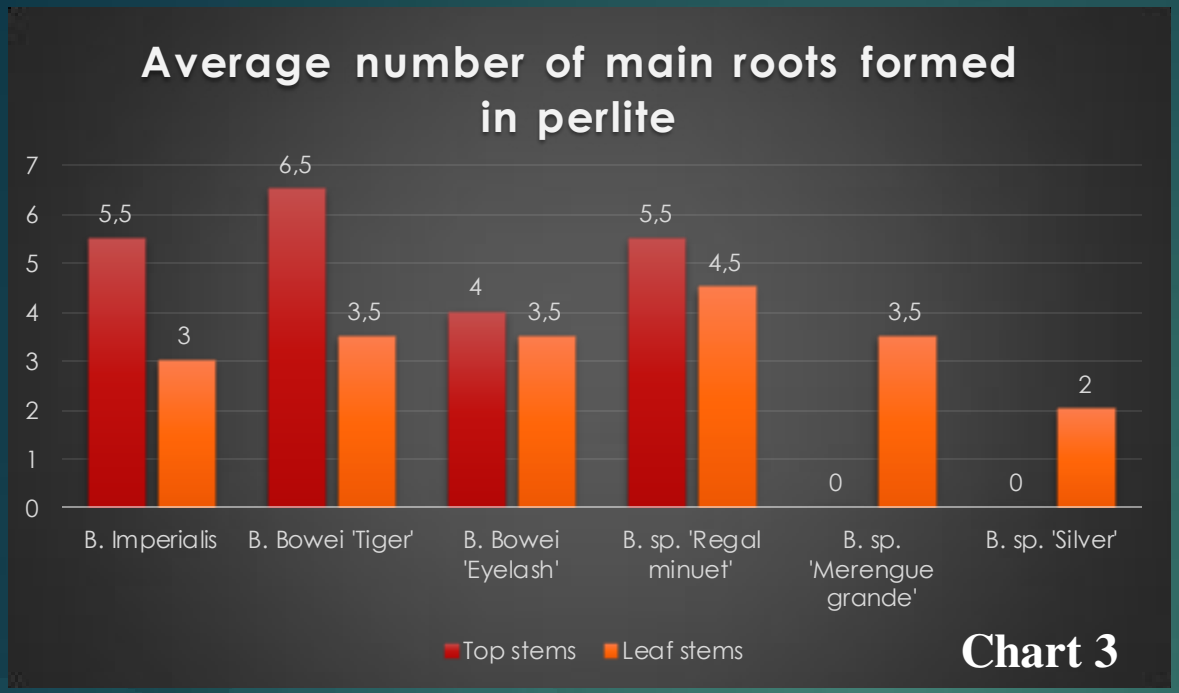


Chart 3

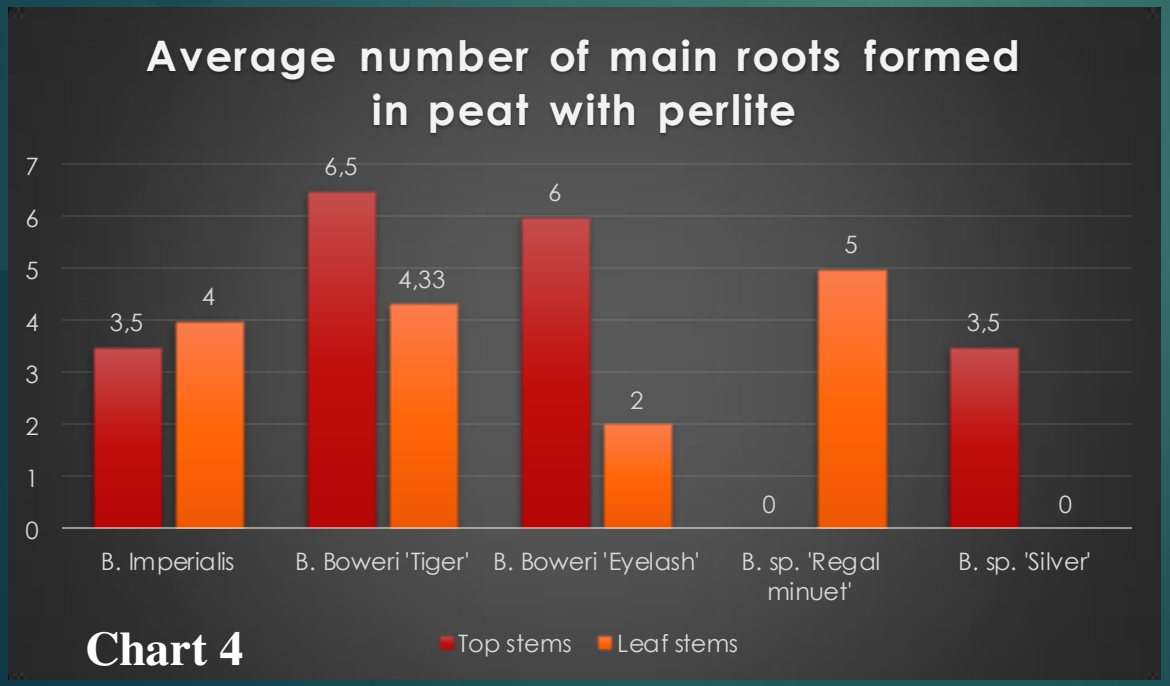


Chart 4

Stems rooted in perlite, date 10.11.2020

Stems rooted in peat with perlite, date 10.11.2020

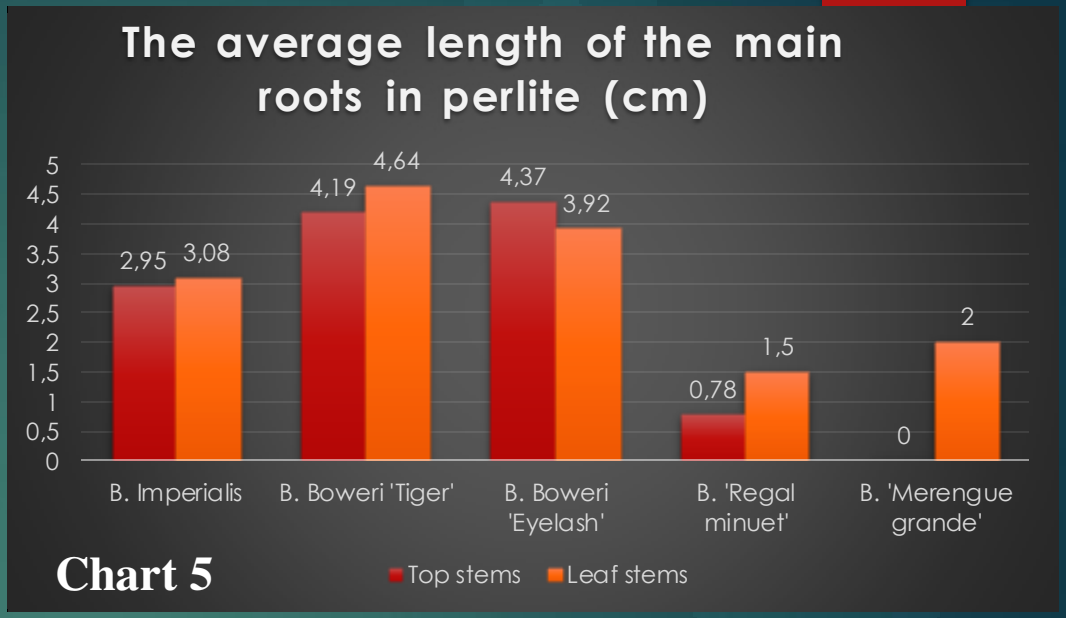


Chart 5

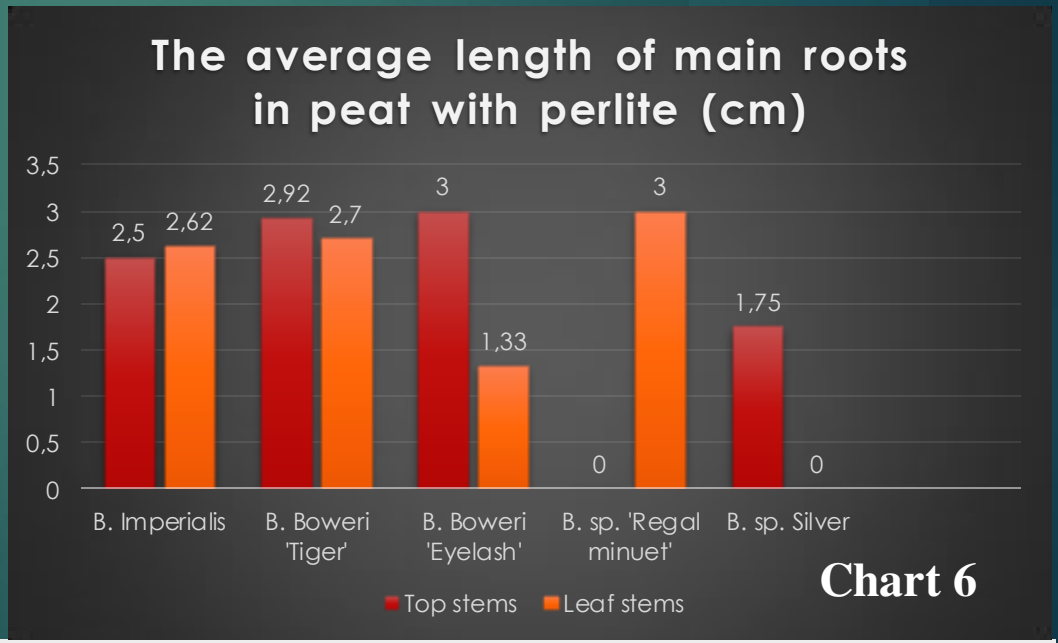


Chart 6

The percentage of viability after 2 weeks from planting stems from perlite, 27.11.2020

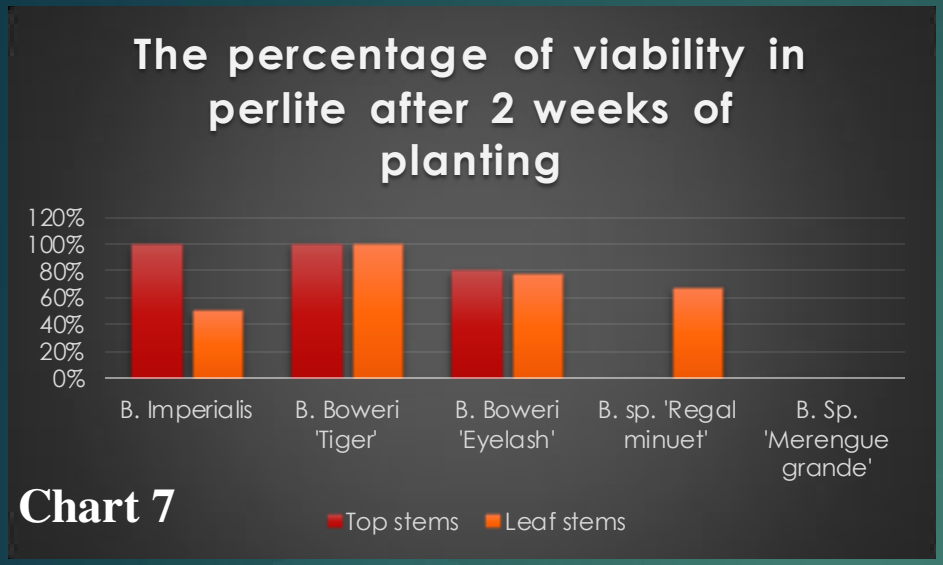


Chart 7

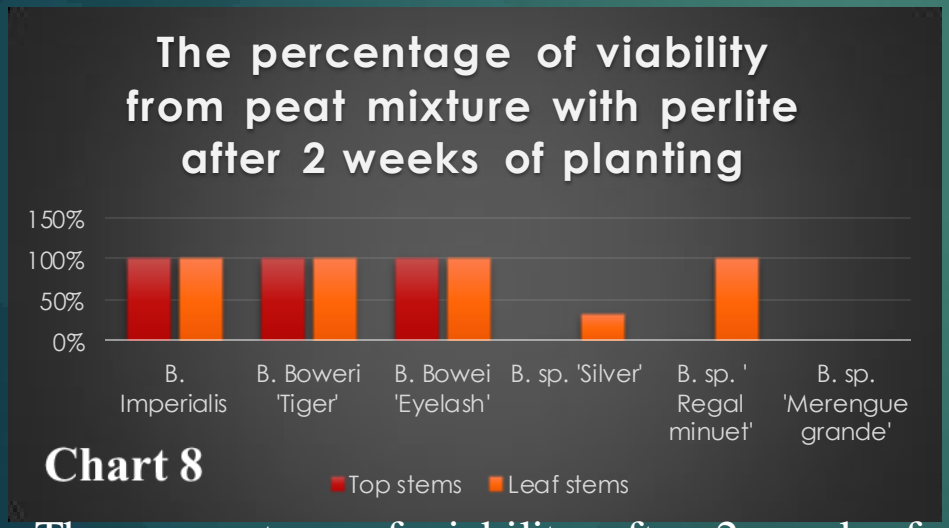


Chart 8

The percentage of viability after 2 weeks from planting stems from peat mixture with perlite, 27.11.2020

Conclusion and recommendations

- The percentage of rooting varied both depending on the culture substrate and depending on the type of stems and the species and variety.
- Regarding the rooting substrate, the rooting percentage was 100 for *Begonia tiger* and *Begonia eyelash* in perlite.
- Also, the average number of roots formed and their length recorded higher values in the experimental variant V1 represented by perlite with values between 2.00 - 6.50 and length 1.52 - 10.75 cm, compared to the average number of formed roots and their length in the experimental variant V2 represented by perlite peat with values between 1.50 - 4.50 and length 1.50 - 6.50 cm.
- Although the rooting percentage was higher in perlite (50 - 100%), the percentage of viable plants after planting the rooted stems in the final substrate and the subsequent plant accommodation was better in the case of rooted stems from the peat and perlite substrate (33 - 100%)
- The varieties Merengue grande and Regal Menuet with the most colorful leaves recorded the worst results, they resisted many stems to propagate, but they had better results multiplied by leaves than by top stems.

Bibliography

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